

Remarks

The Office Action mailed December 21, 2007 has been carefully reviewed and the following remarks have been made in consequence thereof.

Claims 1-20 are now pending in this application. Claims 7-20 stand rejected. Claims 1-6 have been withdrawn.

Reconsideration of the restriction requirement imposed under 35 U.S.C. § 121 is respectfully requested.

A restriction to either invention I, consisting of Claims 1-6 drawn to a method for fabricating a turbine combustor, classified in Class 431, subclass 183, or invention II, consisting of claims 7-20, drawn to a combustor, classified in class 60, subclass 748, was imposed. In response, Applicants confirm the election with traverse to prosecute the invention of Group II, claims 7-20.

The requirement for election is traversed because the inventions set out by the claims in Groups I and II are clearly related. Applicants submit that a thorough search and examination of either Group would be relevant to the examination of the other Group and would not be a serious burden on the Examiner. Additionally, requirements for election are not mandatory under 35 U.S.C. 121. Accordingly, Applicants respectfully request reconsideration of the election requirement.

The rejection of Claims 7, 8, 13-15, and 18-20 under 35 U.S.C. § 102(b) as being unpatentable over Angell et al. (U.S. Pat. No. 4,938,019) ("Angell") is respectfully traversed.

Angell describes an igniter assembly 10 for a combustor of a gas turbine engine. Igniter assembly 10 includes a primary nozzle body 12 and a hollow cylindrical sleeve 16. An annular venturi 80c, 80d, 80e is downstream of swirl vanes 84 and is coaxial with a longitudinal axis L of assembly 10. An inner sleeve extension 62 defines an outer surface of the venturi 80c, 80d, 80e. Inner sleeve extension 62 is coupled to an inner annular shoulder 52 of nozzle body 12. An outer sleeve extension 60 defines a radially inner surface of a swirler that is radially outward of the venturi 80c, 80d, 80e and that includes outer swirl vanes 106. Outer swirl vanes 106 are coupled to outer sleeve extension 60 and extend radially outward to an outer air shroud 100. Outer sleeve extension 60 is coupled to outer

annular shoulder 50 of nozzle body 12. Fuel flows through annular chambers 72 and 73 between outer sleeve extension 60 and inner sleeve extension 62. Notably, Angell does not describe nor suggest a swirler coupled to the venturi to substantially prevent fluid flow between a radially inner surface of the swirler and a radially outer surface of the venturi at upstream and downstream portions of the venturi, wherein a gap is defined between the radially inner surface of the swirler and the radially outer surface of the venturi at a middle portion of the venturi.

Claim 7 recites a combustor for a gas turbine engine comprising “a venturi comprising an upstream portion, a downstream portion and a middle portion extending therebetween . . . a secondary swirler extending circumferentially around said venturi, said secondary swirler coupled to said venturi to substantially prevent fluid flow between a radially inner surface of said secondary swirler and a radially outer surface of said venturi at said upstream and downstream portions, a gap is defined between said radially inner surface of said secondary swirler and said radially outer surface of said venturi middle portion.”

Angell does not describe nor suggest a combustor as is recited in Claim 7. Specifically, Angell does not describe nor suggest a swirler coupled to the venturi to substantially prevent fluid flow between a radially inner surface of the swirler and a radially outer surface of the venturi at upstream and downstream portions of the venturi, wherein a gap is defined between the radially inner surface of the swirler and the radially outer surface of the venturi at a middle portion of the venturi. Rather, Angell describes a swirler that is coupled to a primary nozzle body, such that an annular fuel flow path extends between the radially inner surface of the swirler and the radially outer surface of the venturi along the full length of the venturi. Accordingly, for at least the reasons set forth above, Claim 7 is submitted to be patentable over Angell.

Claims 8 and 13 depend from independent Claim 7. When the recitations of Claims 8 and 13 are considered in combination with the recitations of Claim 7, Applicants submit that Claims 8 and 13 likewise are patentable over Angell.

Claim 14 recites a gas turbine engine comprising a combustor comprising “an annular air swirler and an annular venturi, said annular venturi comprising an upstream portion, a downstream portion and a middle portion extending therebetween, said annular air swirler coupled to said venturi to substantially prevent fluid flow between a radially inner surface of

said annular air swirler and a radially outer surface of said annular venturi at said upstream and downstream portions, a gap is defined between said radially inner surface of said air swirler and said radially outer surface of said venturi middle portion.”

Angell does not describe nor suggest a gas turbine engine as is recited in Claim 14. Specifically, Angell does not describe nor suggest a swirler coupled to the venturi to substantially prevent fluid flow between a radially inner surface of the swirler and a radially outer surface of the venturi at upstream and downstream portions of the venturi, wherein a gap is defined between the radially inner surface of the swirler and the radially outer surface of the venturi at a middle portion of the venturi. Rather, Angell describes a swirler that is coupled to a primary nozzle body, such that an annular fuel flow path extends between the radially inner surface of the swirler and the radially outer surface of the venturi along the full length of the venturi. Accordingly, for at least the reasons set forth above, Claim 14 is submitted to be patentable over Angell.

Claims 15 and 18-20 depend from independent Claim 14. When the recitations of Claims 15 and 18-20 are considered in combination with the recitations of Claim 14, Applicants submit that Claims 15 and 18-20 likewise are patentable over Angell.

For at least the reasons set forth above, Applicants respectfully request that the Section 102 rejection of Claims 7, 8, 13-15, and 18-20 be withdrawn.

The rejection of Claims 7, 11, 14 and 17 under 35 U.S.C. § 102(b) as being unpatentable over Hura et al. (U.S. Pat. No. 6,389,815) (“Hura”) is respectfully traversed.

Hura describes a combustor 24 for an aircraft turbofan engine 10. Combustor 24 includes a fuel nozzle assembly 102 that is positioned within a combustor dome 100. An annular housing 130 surrounds a primary fuel injector 122 such that an inner annular air passageway 132 is defined. Housing 130 is coupled to the primary fuel injector 122 by a plurality of radially-extending inner swirl vanes 134. A second annular member 146 surrounds housing 130 and is coupled to housing 130 by a plurality of radially-extending outer swirl vanes 164. Member 146 includes a reduced-diameter intermediate section 154 and an outwardly diverging outer section 156 that define a venturi. An outer wall 148 of member 146 defines a radially outer surface of the venturi. An annular passageway 176 is radially outward of outer wall 148. Passageway 176 supplies air towards a secondary fuel injector 126 that is housed in an annular housing 168 surrounding passageway 176. An outer

ring 128 is radially outward of housing 168. An outer wall 190 of ring 128 includes openings 194 inclined to define swirl vanes 196 through which compressor discharge air flows. A wall 170 defines a radially inner surface of a flow path for air passing through swirl vanes 196. Notably, Hura does not describe nor suggest a swirler coupled to the venturi to substantially prevent fluid flow between a radially inner surface of the swirler and a radially outer surface of the venturi at upstream and downstream portions of the venturi, wherein a gap is defined between the radially inner surface of the swirler and the radially outer surface of the venturi at a middle portion of the venturi.

Claim 7 recites a combustor for a gas turbine engine comprising “a venturi comprising an upstream portion, a downstream portion and a middle portion extending therebetween . . . a secondary swirler extending circumferentially around said venturi, said secondary swirler coupled to said venturi to substantially prevent fluid flow between a radially inner surface of said secondary swirler and a radially outer surface of said venturi at said upstream and downstream portions, a gap is defined between said radially inner surface of said secondary swirler and said radially outer surface of said venturi middle portion.”

Hura does not describe nor suggest a combustor as is recited in Claim 7. Specifically, Hura does not describe nor suggest a swirler coupled to the venturi to substantially prevent fluid flow between a radially inner surface of the swirler and a radially outer surface of the venturi at upstream and downstream portions of the venturi, wherein a gap is defined between the radially inner surface of the swirler and the radially outer surface of the venturi at a middle portion of the venturi. Rather, Hura describes a swirler coupled to an outer housing, and an annular cooling passageway that extends along the full length of the venturi between the radially inner surface of the swirler and the radially outer surface of the venturi. Accordingly, for at least the reasons set forth above, Claim 7 is submitted to be patentable over Hura.

Claim 11 depends from independent Claim 7. When the recitations of Claim 11 are considered in combination with the recitations of Claim 7, Applicants submit that Claim 11 likewise is patentable over Hura.

Claim 14 recites a gas turbine engine comprising a combustor comprising “an annular air swirler and an annular venturi, said annular venturi comprising an upstream portion, a downstream portion and a middle portion extending therebetween, said annular air swirler

coupled to said venturi to substantially prevent fluid flow between a radially inner surface of said annular air swirler and a radially outer surface of said annular venturi at said upstream and downstream portions, a gap is defined between said radially inner surface of said air swirler and said radially outer surface of said venturi middle portion.”

Hura does not describe nor suggest a combustor as is recited in Claim 14. Specifically, Hura does not describe nor suggest a swirler coupled to the venturi to substantially prevent fluid flow between a radially inner surface of the swirler and a radially outer surface of the venturi at upstream and downstream portions of the venturi, wherein a gap is defined between the radially inner surface of the swirler and the radially outer surface of the venturi at a middle portion of the venturi. Rather, Hura describes a swirler coupled to an outer housing, and an annular cooling passageway that extends along the full length of the venturi between the radially inner surface of the swirler and the radially outer surface of the venturi. Accordingly, for at least the reasons set forth above, Claim 14 is submitted to be patentable over Hura.

Claim 17 depends from independent Claim 14. When the recitations of Claim 17 are considered in combination with the recitations of Claim 14, Applicants submit that Claim 17 likewise is patentable over Hura.

For at least the reasons set forth above, Applicants respectfully request that the Section 102 rejection of Claims 7, 11, 14 and 17 be withdrawn.

The rejection of Claims 7, 11, 14 and 17 under 35 U.S.C. § 102(c) as being unpatentable over Bibler et al. (U.S. Pat. No. 6,871,501) (“Bibler”) is respectfully traversed.

Bibler describes a gas turbine engine 10 that includes a combustor 16. Combustor 16 includes mixer assemblies 41 that each include a pilot centerbody 54 oriented along a longitudinal axis 52 of each mixer assembly 41. An annular centerbody 43 surrounds pilot centerbody 54. An inner passage wall 102 of centerbody 43 includes a converging surface 104 that defines a venturi throat 107. A radially outer surface 100 of centerbody 43 includes a plurality of fuel injection ports 98. A fuel swirler 140 is radially outward of centerbody 43 such that swirled fuel flows from the swirler 140 into a premixer cavity 82. Centerbody outer surface 100 also defines a radially inner surface of premixer cavity 82. Notably, Bibler does not describe nor suggest a swirler coupled to the venturi to substantially prevent fluid flow between a radially inner surface of the swirler and a radially outer surface of the venturi at

upstream and downstream portions of the venturi, wherein a gap is defined between the radially inner surface of the swirler and the radially outer surface of the venturi at a middle portion of the venturi.

Claim 7 recites a combustor for a gas turbine engine comprising “a venturi comprising an upstream portion, a downstream portion and a middle portion extending therebetween . . . a secondary swirler extending circumferentially around said venturi, said secondary swirler coupled to said venturi to substantially prevent fluid flow between a radially inner surface of said secondary swirler and a radially outer surface of said venturi at said upstream and downstream portions, a gap is defined between said radially inner surface of said secondary swirler and said radially outer surface of said venturi middle portion.”

Bibler does not describe nor suggest a combustor as is recited in Claim 7. Specifically, Bibler does not describe nor suggest a swirler coupled to the venturi to substantially prevent fluid flow between a radially inner surface of the swirler and a radially outer surface of the venturi at upstream and downstream portions of the venturi, wherein a gap is defined between the radially inner surface of the swirler and the radially outer surface of the venturi at a middle portion of the venturi. Rather, Bibler describes a plurality of fuel injection ports that are supplied a fuel flow through a gap that is defined between the radially inner surface of the swirler and the radially outer surface of the venturi along the full length of the venturi. Accordingly, for at least the reasons set forth above, Claim 7 is submitted to be patentable over Bibler.

Claim 11 depends from independent Claim 7. When the recitations of Claim 11 are considered in combination with the recitations of Claim 7, Applicants submit that Claim 11 likewise is patentable over Bibler.

Claim 14 recites a gas turbine engine comprising a combustor comprising “an annular air swirler and an annular venturi, said annular venturi comprising an upstream portion, a downstream portion and a middle portion extending therebetween, said annular air swirler coupled to said venturi to substantially prevent fluid flow between a radially inner surface of said annular air swirler and a radially outer surface of said annular venturi at said upstream and downstream portions, a gap is defined between said radially inner surface of said air swirler and said radially outer surface of said venturi middle portion.”

Bibler does not describe nor suggest a combustor as is recited in Claim 14. Specifically, Bibler does not describe nor suggest a swirler coupled to the venturi to substantially prevent fluid flow between a radially inner surface of the swirler and a radially outer surface of the venturi at upstream and downstream portions of the venturi, wherein a gap is defined between the radially inner surface of the swirler and the radially outer surface of the venturi at a middle portion of the venturi. Rather, Bibler describes a plurality of fuel injection ports that are supplied a fuel flow through a gap that is defined between the radially inner surface of the swirler and the radially outer surface of the venturi along the full length of the venturi. Accordingly, for at least the reasons set forth above, Claim 14 is submitted to be patentable over Bibler.

Claim 17 depends from independent Claim 14. When the recitations of Claim 17 are considered in combination with the recitations of Claim 14, Applicants submit that Claim 17 likewise is patentable over Bibler.

For at least the reasons set forth above, Applicants respectfully request that the Section 102 rejection of Claims 7, 11, 14 and 17 be withdrawn.

The rejection of Claims 9, 10 and 16 under 35 U.S.C. § 103(a) as being unpatentable over Angell in view of Koshoffer et al. (U.S. Pat. No. 4,584,834) ("Koshoffer") is respectfully traversed.

Angell is as described above.

Koshoffer describes a combustor 10 that includes a carburetion assembly 22. The carburetion assembly 22 includes a first annular member 72 that receives a fuel injector nozzle 40. A plurality of swirler vanes 76 are radially outwardly from member 72. An annular flange 80 is secured to the radially outward portions of the swirler vanes 76. A forward portion 88 of a second annular member 86 is slidably coupled to flange 80. An aft portion 92 of member 86 defines a venturi. A plurality of second swirler vanes 94 are radially outward from aft portion 92. Notably, Koshoffer does not describe nor suggest a swirler coupled to the venturi to substantially prevent fluid flow between a radially inner surface of the swirler and a radially outer surface of the venturi at upstream and downstream portions of the venturi, wherein a gap is defined between the radially inner surface of the swirler and the radially outer surface of the venturi at a middle portion of the venturi.

Claim 7 recites a combustor for a gas turbine engine comprising “a venturi comprising an upstream portion, a downstream portion and a middle portion extending therebetween . . . a secondary swirler extending circumferentially around said venturi, said secondary swirler coupled to said venturi to substantially prevent fluid flow between a radially inner surface of said secondary swirler and a radially outer surface of said venturi at said upstream and downstream portions, a gap is defined between said radially inner surface of said secondary swirler and said radially outer surface of said venturi middle portion.”

Neither Angell nor Koshoffer, considered alone or in combination, describes or suggests a method as is recited in Claim 7. Specifically, neither Angell nor Koshoffer, considered alone or in combination, describes or suggests a swirler coupled to the venturi to substantially prevent fluid flow between a radially inner surface of the swirler and a radially outer surface of the venturi at upstream and downstream portions of the venturi, wherein a gap is defined between the radially inner surface of the swirler and the radially outer surface of the venturi at a middle portion of the venturi. Rather, Angell describes a swirler that is coupled to a primary nozzle body, such that an annular fuel flow path extends between the radially inner surface of the swirler and the radially outer surface of the venturi along the full length of the venturi, and Koshoffer describes a swirler that is integrally formed with a venturi such that no gap is defined between them. Accordingly, for at least the reasons set forth above, Claim 7 is submitted to be patentable over Angell in view of Koshoffer.

Claims 9 and 10 depend from independent Claim 7. When the recitations of Claims 9 and 10 are considered in combination with the recitations of Claim 7, Applicants submit that Claims 9 and 10 likewise are patentable over Angell in view of Koshoffer.

Claim 14 recites a gas turbine engine comprising a combustor comprising “an annular air swirler and an annular venturi, said annular venturi comprising an upstream portion, a downstream portion and a middle portion extending therebetween, said annular air swirler coupled to said venturi to substantially prevent fluid flow between a radially inner surface of said annular air swirler and a radially outer surface of said annular venturi at said upstream and downstream portions, a gap is defined between said radially inner surface of said air swirler and said radially outer surface of said venturi middle portion.”

Neither Angell nor Koshoffer, considered alone or in combination, describes or suggests a method as is recited in Claim 14. Specifically, neither Angell nor Koshoffer,

considered alone or in combination, describes or suggests a swirler coupled to the venturi to substantially prevent fluid flow between a radially inner surface of the swirler and a radially outer surface of the venturi at upstream and downstream portions of the venturi, wherein a gap is defined between the radially inner surface of the swirler and the radially outer surface of the venturi at a middle portion of the venturi. Rather, Angell describes a swirler that is coupled to a primary nozzle body, such that an annular fuel flow path extends between the radially inner surface of the swirler and the radially outer surface of the venturi along the full length of the venturi, and Koshoffer describes a swirler that is integrally formed with a venturi such that no gap is defined between them. Accordingly, for at least the reasons set forth above, Claim 14 is submitted to be patentable over Angell in view of Koshoffer.

Claim 16 depends from independent Claim 14. When the recitations of Claim 16 are considered in combination with the recitations of Claim 14, Applicants submit that Claim 16 likewise is patentable over Angell in view of Koshoffer.

Moreover, it is impermissible to use the claimed invention as an instruction manual or “template” to piece together the teachings of the cited art so that the claimed invention is rendered obvious. Specifically, one cannot use hindsight reconstruction to pick and choose among isolated disclosures in the art to replicate the claimed invention. It appears that the present rejection reflects an impermissible attempt to use the instant claims as a guide or roadmap in formulating the rejection using impermissible hindsight reconstruction of the invention. The United States Supreme Court has recently expressed concern regarding distortion caused by hindsight bias in an obviousness analysis, and notes that factfinders should be cautious of arguments reliant upon ex post reasoning. *See KSR International Co. v. Teleflex, Inc.*, 127 S.Ct. 1727, 1742 (2007). The Supreme Court also explained that, following “common sense,” “familiar items may have obvious uses beyond their primary purposes, and in many cases a person of ordinary skill will be able to fit the teachings of multiple patents together like pieces of a puzzle.” *Id.* Applicants respectfully submit that the teachings of Angell and Koshoffer do not fit together like pieces of a puzzle, but rather are two isolated disclosures that have been chosen in an attempt to replicate the present invention. Of course, such a combination is impermissible, and for this reason alone, Applicants request that the Section 103 rejection be withdrawn.

For at least the reasons set forth above, Applicants respectfully request that the Section 103 rejection of Claims 9, 10 and 16 be withdrawn.

The rejection of Claim 12 under 35 U.S.C. § 103(a) as being unpatentable over Angell in view of Campbell (U.S. Pat. No. 5,220,786) ("Campbell") is respectfully traversed.

Angell is as described above.

Campbell describes a combustor 10 that includes a swirl cup package 16. Package 16 includes a swirler 19, and a swirl cup 20 that surrounds a venturi 22. A heat shield 27 is on an inner surface 23 of the venturi 22, and a thermal barrier coating 28 is on an outer surface 29 of the venturi 22. Notably, Campbell does not describe nor suggest a swirler coupled to the venturi to substantially prevent fluid flow between a radially inner surface of the swirler and a radially outer surface of the venturi at upstream and downstream portions of the venturi, wherein a gap is defined between the radially inner surface of the swirler and the radially outer surface of the venturi at a middle portion of the venturi.

Claim 7 recites a combustor for a gas turbine engine comprising "a venturi comprising an upstream portion, a downstream portion and a middle portion extending therebetween . . . a secondary swirler extending circumferentially around said venturi, said secondary swirler coupled to said venturi to substantially prevent fluid flow between a radially inner surface of said secondary swirler and a radially outer surface of said venturi at said upstream and downstream portions, a gap is defined between said radially inner surface of said secondary swirler and said radially outer surface of said venturi middle portion."

Neither Angell nor Campbell, considered alone or in combination, describes or suggests a method as is recited in Claim 7. Specifically, neither Angell nor Campbell, considered alone or in combination, describes or suggests a swirler coupled to the venturi to substantially prevent fluid flow between a radially inner surface of the swirler and a radially outer surface of the venturi at upstream and downstream portions of the venturi, wherein a gap is defined between the radially inner surface of the swirler and the radially outer surface of the venturi at a middle portion of the venturi. Rather, Angell describes a swirler that is coupled to a primary nozzle body, such that an annular fuel flow path extends between the radially inner surface of the swirler and the radially outer surface of the venturi along the full length of the venturi, and Campbell describes a swirler coupled to a venturi such that no gap is defined between them. Accordingly, for at least the reasons set forth above, Claim 7 is submitted to be patentable over Angell in view of Campbell.

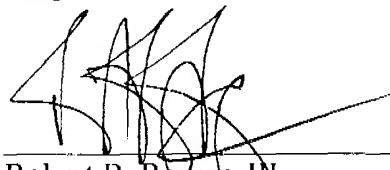
Claim 12 depends from independent Claim 7. When the recitations of Claim 12 are considered in combination with the recitations of Claim 7, Applicants submit that Claim 12 likewise is patentable over Angell in view of Campbell.

Moreover, as discussed above, it is impermissible to use the claimed invention as an instruction manual or "template" to piece together the teachings of the cited art so that the claimed invention is rendered obvious. Applicants respectfully submit that the teachings of Angell and Campbell do not fit together like pieces of a puzzle, but rather are two isolated disclosures that have been chosen in an attempt to replicate the present invention. Of course, such a combination is impermissible, and for this reason alone, Applicants request that the Section 103 rejection be withdrawn.

For at least the reasons set forth above, Applicants respectfully request that the Section 103 rejection of Claim 12 be withdrawn.

In view of the foregoing amendment and remarks, all the claims now active in this application are believed to be in condition for allowance. Reconsideration and favorable action is respectfully solicited.

Respectfully Submitted,

A handwritten signature in black ink, appearing to read 'R. B. Roeser, III', written over a horizontal line.

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